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Nomenclatural notes of *Sabina convallium* var. *microsperma* (Cupressaceae)

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Abstract

The name *Sabina convallium* var. *microsperma* W.C.Cheng & W.T.Wang was not validly published when it was first described in 1975, but was validated in 1978 at the same time as the specific combination *Sabina convallium* (Rehder & E.H.Wilson) W.C.Cheng & W.T.Wang was validly published in *Flora Reipublicae Popularis Sinicae*. Under Art. 41.6 of the Shenzhen Code, other names based on *Sabina convallium* var. *microsperma* were valid, including *Sabina microsperma* (W.C.Cheng & L.K.Fu) W.C.Cheng & L.K.Fu, *Juniperus convallium* var. *microsperma* (W.C.Cheng & L.K.Fu) Silba, *Juniperus microsperma* (W.C.Cheng & L.K.Fu) R.P.Adams, despite the reference of the basionym being erroneously cited when these authors made the new combinations.

Keywords

Conifer, Cupressacae, nomenclature, *Sabina convallium* var. *microsperma*

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Introduction

When working on an updated catalogue of gymnosperms, we noticed that the small-seeded juniper has nomenclatural problems. The small-seeded juniper was treated either as a species, e.g., *Juniperus microsperma* (W.C.Cheng & L.K.Fu) R.P.Adams (Adams 2008, 2014; Shang et al. 2015), *Sabina microsperma* (W.C.Cheng & L.K.Fu) W.C.Cheng & L.K.Fu (Fu 1983, in Fl. Xizang. 1: 390), or a variety, e.g., *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu (Cheng et al. 1975; Wang et al. 1978), *Juniperus convallium* var. *microsperma* (W.C.Cheng & L.K.Fu) Silba (Silba 1984; Fu et al. 1999; Farjon 2010). However, it remained ambiguous whether these scientific names used in previous taxonomic works were validly published.

Sabina convallium var. *microsperma* W.C.Cheng & L.K.Fu was first recognized and described in Cheng et al. (1975, Acta Phytotax. Sin. 13: 86), but was not validly published in that work under Art. 35.1 of the Shenzhen Code (Turland et al. 2018), because the specific name *Sabina convallium* (Rehder & E.H.Wilson) W.C.Cheng & W.T.Wang was not validly published at that time. W.C.Cheng & W.T.Wang made the new combination *Sabina convallium* (Rehder & E.H.Wilson) W.C.Cheng & W.T.Wang (Cheng 1961, in Trees of China, 1: 257), but they did not validly publish the combination under Art. 41.5 because this combination was made after Jan. 1st of 1953 and the authors cited only the basionym but without the reference citation. W.C.Cheng & W.T.Wang unintentionally but validly published the specific combination in Flora Reipublicae Popularis Sinicae (Wang et al. 1978, 7: 372) where they correctly cited the basionym and its reference. In the same work, the varietal name *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu was validated by citing the reference of the protologue (Wang et al. 1978, 7: 373).

There are a few later names based on the invalid name *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu (Cheng et al. 1975). In 1983, W.C.Cheng & L.K.Fu intended to make a new combination *Sabina microsperma* (W.C.Cheng & L.K.Fu) W.C.Cheng & L.K.Fu (Fu 1983, Fl. Xizang. 1: 390), but they cited the invalid name *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu as the basionym and its publication in 1975. Silba (1984) made a new combination *Juniperus convallium* var. *microsperma* (W.C.Cheng & L.K.Fu) Silba based on the invalid name *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu (Cheng et al. 1975); Adams (2000) treated it as a species in *Juniperus* making the combination *Juniperus microsperma* (W.C.Cheng & L.K.Fu) R.P.Adams based on the same invalid basionym. Under Art. 41.6, all these combinations are valid though the reference of the basionym should be corrected.

Adams (2008, 2014) divided *Juniperus* into three sections, viz. sect. *Caryocedrus* Endl., sect. *Juniperus*, and sect. *Sabina* (Mill.) Spach, and indicated that the three sections can be distinguished using morphological characters, e.g. leaves decurrent or not (decurrent in sect. *Sabina* vs. jointed in sect. *Caryocedrus* and *Juniperus*), leaf shape (acicular in sect. *Caryocedrus* and *Juniperus* vs. scale-like in sect. *Sabina*), seed cones size

(8–25 mm in sect. *Caryocedrus* vs. 6–18 mm in sect. *Juniperus* and *Sabina*), seeds fusion (fused in sect. *Caryocedrus* vs. free in sect. *Juniperus* and *Sabina*). Mao et al. (2010) suggested that all of the three sections are monophyletic. Yang et al. (2022) treated *Sabina* as a separate genus from *Juniperus* considering phylogeny, morphology, and utilization purposes. Based on the phylogeny of nuclear markers, Shang et al. (2015) suggested that *Juniperus microsperma* is not closely related to *J. convallium*, but sister to a small clade including *J. semiglobosa* and *J. sabina*. Therefore, we treated the generic name *Sabina* and the specific name *Sabina microsperma* as accepted.

Nomenclature

Sabina convallium **(Rehder & E.H.Wilson) W.C.Cheng & W.T.Wang in W.C.Cheng & L.K.Fu, Fl. Reipubl. Popularis Sin. 7: 372 (1978).**

≡ *Juniperus convallium* Rehder & E.H.Wilson in Pl. Wilson. (Sargent) 2(1): 62 (1914); *Sabina convallium* (Rehder & E.H.Wilson) W.C.Cheng & W.T.Wang in W.C.Cheng, Trees of China, 1: 257 (1961) et in W.C.Cheng et al., Acta Phytotax. Sin. 13(4): 76 (1975), *nom. inval.*

Type. China (中国). Sichuan (四川), arid places, alt. 2500 m, Aug. 1904, Vietch Exped. 3010 (holotype: A00056809, Fig. 1; isotypes: BM000959921, K001090508, K001090509, K000089628, P00748989, S-C-6511, SYS00001562).

Note. Rehder and Wilson (1914) cited one single collection (Veitch Exped. 3010) in the protologue which should be considered as the type specimen. Adams (2008, 2014) and Farjon (2010) indicated that the specimen in A is the holotype and the isotypes are in BM and K. We found five additional isotypes in international herbaria.

Sabina microsperma **(W.C.Cheng & L.K.Fu) W.C.Cheng & L.K.Fu in Fl. Xizang. 1: 390 (1983).**

≡ *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu in W.C.Cheng et al., Acta Phytotax. Sin. 13(4): 86 (1975), *nom. inval.*; *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu in W.C.Cheng & L.K.Fu, Fl. Reipubl. Popularis Sin. 7: 373 (1978); *Juniperus convallium* var. *microsperma* (W.C.Cheng & L.K.Fu) Silba in Phytologia Mem. 7: 33 (1984); *Juniperus microsperma* (W.C.Cheng & L.K.Fu) R.P.Adams in Biochem. Syst. Ecol. 28(6): 540 (2000).

Type. China (中国). Xizang (西藏), Qamdu (昌都), Sumzom (松宗), 26 Oct. 1961, Forestry Exped. (森林调查队) 10019 (holotype: PE00002535, Fig. 2).

Figure 1. Holotype of *Juniperus convallium* Rehder & E.H.Wilson: Vietch Exped. 3010 (A00056809).

林调队10019 Sabina mekongensis Kom.
1956.10.26. 昌都地区.
DAP Photo # 697905
1599253
Juniperus convallium Rehder & E.H. Wilson var. microsperma (W.C. Cheng & L.K. Fu) Silba
Det. A. Farjon (RBG Kew) 29/9/ 2000
HOLOTYPUS
Typus!
Sabina convallium var. microsperma Cheng et L.K. Fu, var. nov.

Figure 2. Holotype of *Sabina convallium* var. *microsperma* W.C.Cheng & L.K.Fu: Forestry Exped. 10019 (PE00002535).

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References

Adams RP (2000) Systematics of the one seeded *Juniperus* of the eastern hemisphere based on leaf essential oils and random amplified polymorphic DNAs (RAPDs). Biochemical Systematics and Ecology 28(6): 529–543. https://doi.org/10.1016/S0305-1978(99)00096-4

Adams RP (2008) Junipers of the World: the Genus *Juniperus*. 2nd Edn. Trafford, Victoria.

Adams RP (2014) Junipers of the World: the Genus *Juniperus*. 4th Edn. Trafford, Bloomington.

Cheng WC (1961) Trees of China (中国树木学). Jiangsu People's Publishing House Co., Ltd., Nanjing.

Cheng WC, Fu LK, Cheng CY (1975) Gymnospermae Sinicae. Zhiwu Fenlei Xuebao 13: 56–90.

Farjon A (2010) A Handbook of the World's Conifers. Brill, Leiden-Boston. https://doi.org/10.1163/9789047430629

Fu LK (1983) Gymnospermae. In: Wu CY (Ed.) Flora Xizangica (Vol. 1). Science Press, Beijing, 356–405.

Fu LG, Yu YF, Farjon A (1999) Cupressacae. In: Wu ZY, Raven PR (Eds) Flora of China (Vol. 4). Science Press, Beijing & Missouri Botanical Garden Press, St. Louis, 62–77.

Mao KS, Hao G, Liu JQ, Adams RP, Milne RI (2010) Diversification and biogeography of Juniperus (Cupressaceae): Variable diversification rates and multiple intercontinental dispersals. The New Phytologist 188(1): 254–272. https://doi.org/10.1111/j.1469-8137.2010.03351.x

Rehder A, Wilson EH (1914) Pinaceae. In: Sargent CS (Ed.) Plantae Wilsonianae: An Enumeration of the Woody Plants Collected in Western China for the Arnold Arboretum of Harvard University during the Years by E.H.Wilson (Vol. 2). Cambridge University Press, Cambridge, 10–62.

Shang HY, Li ZH, Dong M, Adams RP, Miehe G, Opgenoorth L, Mao KS (2015) Evolutionary origin and demographic history of an ancient conifer (*Juniperus microsperma*) in the Qinghai-Tibetan Plateau. Scientific Reports 5(1): 10216. https://doi.org/10.1038/srep10216

Silba J (1984) An international census of the Coniferae, I. Phytologia Memoirs 7: 3–79. https://doi.org/10.5962/bhl.title.12961

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber WH, Li DZ, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF [Eds] (2018) International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten. https://doi.org/10.12705/Code.2018

Wang WT, Cheng WC, Fu LK, Chu CD (1978) *Sabina*. In: Cheng WC, Fu LK (Eds) Flora Reipublicae Popularis Sinicae (Vol. 7). Science Press, Beijing, 347–376.

Yang Y, Ferguson DK, Liu B, Mao KS, Gao LM, Zhang SZ, Wan T, Rushforth K, Zhang ZX (2022) Recent advances on phylogenomics of gymnosperms and an updated classification. Plant Diversity. https://doi.org/10.1016/j.pld.2022.05.003